Name: Date:

Polynomial Factoring solution (version 34)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 8x + 18 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(8) \pm \sqrt{(8)^2 - 4(1)(18)}}{2(1)}$$

$$x = \frac{-(8) \pm \sqrt{64 - 72}}{2(1)}$$

$$x = \frac{-8 \pm \sqrt{-8}}{2}$$

$$x = \frac{-8 \pm \sqrt{-4 \cdot 2}}{2}$$

$$x = \frac{-8 \pm 2\sqrt{2}\, i}{2}$$

$$x = -4 \pm \sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-8 + 4i$ and $-5 + 2i$ in standard form $(a + bi)$.**

Solution

$$(-8 + 4i) \cdot (-5 + 2i)$$

$$40 - 16i - 20i + 8i^2$$

$$40 - 16i - 20i - 8$$

$$40 - 8 - 16i - 20i$$

$$32 - 36i$$

Polynomial Factoring solution (version 34)

3. **Write function $f(x) = x^3 - 4x^2 - 27x + 90$ in factored form. I'll give you a hint: one factor is $(x - 6)$.**

Solution

	1	-4	-27	90
6		6	12	-90
	1	2	-15	0

$$f(x) = (x-6)(x^2+2x-15)$$

$$f(x) = (x-6)(x-3)(x+5)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+4)\cdot(x+1)^2\cdot(x-2)^2\cdot(x-5)^2$$

Sketch a graph of polynomial $y = p(x)$.